CLAIM

Having thus described the invention we claim as new and desire to secure by Letters Patent:

1. An electrically conductive polymer blend composition comprising the reaction product of an electrically conductive polymer in undoped form and a polydopant.

2. The electrically conductive polymer blend composition defined in claim 1 wherein said polymers interact at a plurality of sites along the length of said polymer thereby resulting in a molecularly compatible blend.

3. The electrically conductive polymer blend composition defined in claim 2 wherein said electrically conducting polymer complexes with said polydopant.

4. The electrically conductive polymer blend composition defined in claim 3 wherein one of said polymers is a rigid polymer.

5. The electrically conductive polymer blend composition defined in claim 3 wherein said electrically conductive polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes,

polypyrroles, polyselenophenes, polyacetylenes formed from soluble precursors and combinations and blends thereof.

6. The electrically conductive polymer blend composition defined in claim 5 wherein said polydopant is a dielectric polymer containing Lewis acid functionality.

7. The electrically conductive polymer blend composition defined in claim 6 wherein said Lewis acid functionality reacts with said electrically conductive polymer in undoped form to convert said conducting polymer to the doped form.

8. The electrically conductive polymer blend composition defined in claim 7 wherein said polydopant is selected from the group consisting of polyacrylic acids, polysulfonic acid, cellulose sulfonic acid, polyamic acid, polyphosphoric acid, polymers containing acid chloride groups (-CO-Cl) and polymers containing sulfonyl chloride groups ($-SO_2Cl$).

9. The electrically conductive polymer blend composition defined in claim 8 wherein said polydopant is polyamic acid that is photosensitive.

10. The electrically conductive polymer blend composition defined in claim 8 wherein said electrically conductive polymer is polyaniline and said polydopant is

polyamic acid.

11. The electrically conductive polymer blend composition defined in claim 8 wherein said electrically conductive polymer is polythiophene and said polydopant is a polyacrylic acid.

12. The electrically conductive polymer blend composition defined in claim 8 that is in form of a gel.

13. The electrically conductive polymer blend composition defined in claim 8 that is formed into a shaped article.

14. The electrically conductive polymer blend composition defined in claim 13 wherein the shaped article is a fiber.

15. An electrically conducting polymer blend composition comprising an electrically conductive polymer in undoped form, a dielectric polymer and a thermally deblockable dopant.

16. The electrically conducting polymer blend composition defined in claim 15 wherein said electrically conductive polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes, polypyrroles, polyselenophenes, polyacetylenes formed from soluble

precursors and combinations and blends thereof.

17. The electrically conducting polymer blend composition defined in claim 15 wherein said dielectric polymer is selected from the group consisting of interpolymers of acrylonitrile-butadiene-styrene, acetal acrylic liquid crystal polymers, polybutylene terephthalate, polycarbonate, polyester, polyetherimide, polyethersulfone, polyethylene, polyethylene terephthalate, polyphenylene oxide polyphenylene sulfide, polypropylene, polystyrene, polyurethane, polyvinyl chloride, styrene-acrylonitrile copolymer fluoropolymers, nylon polyesters and thermoplastic elastomer.

18. The electrically conducting polymer blend composition defined in claim 15 wherein said thermally deblockable dopants are selected from the group consisting of triflates, tosylates and borates.

19. The electrically conducting polymer blend composition defined in claim 15 wherein said triflates, tosylates and borates are selected from the group consisting of $CF_3SO_3H\ NC_5H_5$, $CF_3SO_3H{\cdot}NH_3$, $CF_3SO_3H{\cdot}CH_3NHC$, $CF_3SO_3H{\cdot}(CH_3)_3N$, $CF_3SO_3H{\cdot}C_2H_5NH_2$, $CF_3SO_3H{\cdot}(C_2H_5)_2NH$, $CF_3SO_3H{\cdot}(C_2H_5)_3N$, $CF_3SO_3H{\cdot}(i\text{-}C_3H_7)_2NH$, $CF_3SO_3H{\cdot}(i\text{-}C_3H_7)_2N(C_2H_5)$, $CF_3SO_3H{\cdot}(i\text{-}C_3H_7)_2N(C_2H_4OH)$, $CF_3SO_3H{\cdot}H_2N(C_2H_4OH)$, $CF_3SO_3H{\cdot}HNC_4H_8O$,

$CF_3SO_3H \cdot H_2NC(CH_3)_2CH_2OH$, $CF_3SO_3H \cdot HNC_5H_{10}$, $CF_3SO_3H \cdot HN(C_2H_4OH)_2$, $BF_3C_2H_5NH_2$, $CF_3SO_3(CH_3)_4N$, $H_3C(C_6H_4)SO_3H$.

20. The electrically conducting polymer blend composition defined in claim 15 wherein said dielectric polymer is selected from the group consisting of interpolymers of acrylonitrile-butadiene-styrene, acetal acrylic liquid crystal polymers, polybutylene terephthalate, polycarbonate, polyester, polyetherimide, polyethersulfone, polyethylene, polyethylene terephthalate, polyphenylene oxide, polyphenylene sulfide, polypropylene, polystyrene, polyurethane, polyvinyl chloride, styrene-acrylonitrile copolymer and thermoplastic elastomer; and said thermally deblockable dopants are selected from the group consisting of $CF_3SO_3H\ NC_5H_5$, $CF_3SO_3H \cdot NH_3$, $CF_3SO_3H \cdot CH_3NHC$, $CF_3SO_3H \cdot (CH_3)_3N$, $CF_3SO_3H \cdot C_2H_5NH_2$, $CF_3SO_3H \cdot (C_2H_5)_2NH$, $CF_3SO_3H \cdot (C_2H_5)_3N$, $CF_3SO_3H \cdot (i - C_3H_7)_2NH$, $CF_3SO_3H \cdot (i - C_3H_7)_2N(C_2H_5)$, $CF_3SO_3H \cdot (i - C_3H_7)_2N(C_2H_4OH)$, $CF_3SO_3H \cdot H_2N(C_2H_4OH)$, $CF_3SO_3H \cdot HNC_4H_8O$, $CF_3SO_3H \cdot H_2NC(CH_3)_2CH_2OH$, $CF_3SO_3H \cdot HNC_5H_{10}$, $CF_3SO_3H \cdot HN(C_2H_4OH)_2$, $BF_3C_2H_5NH_2$, $CF_3SO_3(CH_3)_4N$, $H_3C(C_6H_4)SO_3H$.

21. The electrically conducting polymer blend

composition defined in claim 20 wherein said electrically conductive polymer is polyaniline, said dielectric polymer is polycarbonate and said thermally deblockable dopant is diethylamine triflate.

22. The electrically conducting polymer blend composition defined in claim 20 wherein the electrically conductive polymer is polythiophene said dielectric polymer is nylon and said thermally deblockable dopant is $CF_3SO_3H \cdot H_2N(C_2H_4OH)$.

23. The electrically conductive polymer blend composition comprising: a frustrated blend of polyimide and an electrically conductive polymer selected from the group consisting of substituted and unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes, polypyrroles, polyselenophenes, polyacetylenes formed from soluble precursors and combinations and blends thereof.

24. A conductive shaped article comprising:

a doped electrically conductive polymer material in admixture with a dielectric polymer material.

25. The shaped article defined in claim 24, wherein said electrically conductive polymer material is in the form of a fiber.

26. The shaped article defined in claim 24, wherein said body is selected from the group consisting of a crystalline solid, an amorphous solid, a polycrystalline solid a semicrystalline solid and a glass.

27. The shaped article defined in claim 24 further including an anion of a doping agent.

28. The shaped article defined in claim 24, wherein said dielectric polymer material is an anion of polymeric carboxylic acid.

29. The shaped article defined in claim 24 that has been shaped into a stylus suitable for use in resistive film digitizer.

30. A method comprising: providing a shaped article of the material of claim 24, thereupon applying a bias thereto to deposit another composition thereon using a method selected from the group consisting of electrostatic and electrochemical deposition.

31. A method of preparing an electrically conductive intercalated molecular polymer blend composition comprising blending a polydopant with a conducting polymer in undoped form, to obtain a uniform dispersion at a molecular scale as a result of an interaction along the length of said polymer.

32. The method of preparing the electrically conductive polymer blend defined in claim 31, wherein said polydopant is a Lewis acid polymer.

33. The method of preparing the electrically conductive polymer blend defined in claim 32, wherein said Lewis acid polymer is selected from the group consisting of polymeric acid, polysulfonic acid, cellulose sulfonic acid, polyamic acid, photosensitive polyamic acid, polyphosphoric acid, acid chloride containing polymers and sulfonyl chloride containing polymers.

34. The method of preparing the electrically conductive polymer blend defined in claim 31, wherein said conducting polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes, polypyrroles, polyselenophenes, polyacetylenes formed from soluble precursors and combinations and blends thereof.

35. The method of preparing the electrically conductive polymer blend defined in claim 34, wherein said Lewis acid polymer is selected from the group consisting of polymeric acid, polysulfonic acid, cellulose sulfonic acid polyamic acid, photosensitive polyamic

acid, polyphosphoric acid, acid chloride containing polymers and sulfonyl chloride containing polymers.

36. The method of preparing the electrically conductive polymer blend defined in claim 35, wherein the conducting polymer is polyanilene and said Lewis acid polymer is polyamic acid.

37. A method of preparing the electrically conducting polymer system comprising blending a conductive polymer in undoped form with a dielectric polymer and a thermally deblockable dopant, and heating said blend to obtain a conductive blend.

38. The method of preparing the electrically conductive polymer system defined in claim 37, wherein said electrically conductive polymer is selected from the group consisting of substituted and unsubstituted polyparaphenlenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes, polypyrroles, polyselenophenes, polyacetylenes formed from soluble precursors and combinations and blends thereof.

39. The method of preparing the electrically conductive polymer system defined in claim 37, wherein said dielectric polymer is selected from the group consisting of interpolymers of acrylonitrile-butadiene-

styrene, acetal acrylic liquid crystal polymers, polybutylene terephthalate, polycarbonate, polyester, polyetherimide, polyethersulfone, polyethylene, polyethylene terephthalate, polyphenylene oxide polyphenylene sulfide, polypropylene, polystyrene, polyurethane, polyvinyl chloride, styrene-acrylonitrile copolymer and thermoplastic elastomer.

40. The method of preparing the electrically conductive polymer system defined in claim 37, wherein said thermally deblockable dopant is selected from the group consisting of triflates, tosylates and borates.

41. The method of preparing the electrically conductive polymer system defined in claim 39, wherein said triflates, tosylates and borates are selected from the group consisting of $CF_3SO_3H\ NC_5H_5$, $CF_3SO_3H \cdot NH_3$, $CF_3SO_3H \cdot CH_3NHC$, $CF_3SO_3H \cdot (CH_3)_3N$, $CF_3SO_3H \cdot C_2H_5NH_2$, $CF_3SO_3H \cdot (C_2H_5)_2NH$, $CF_3SO_3H \cdot (C_2H_5)_3N$, $CF_3SO_3H \cdot (i - C_3H_7)_2NH$, $CF_3SO_3H \cdot (i - C_3H_7)_2N(C_2H_5)$, $CF_3SO_3H \cdot (i - C_3H_7)_2N(C_2H_4OH)$, $CF_3SO_3H \cdot H_2N(C_2H_4OH)$, $CF_3SO_3H \cdot HNC_4H_8O$, $CF_3SO_3H \cdot H_2NC(CH_3)_2CH_2OH$, $CF_3SO_3H \cdot HNC_5H_{10}$, $CF_3SO_3H \cdot HN(C_2H_4OH)_2$, $BF_3C_2H_5NH_2$, $CF_3SO_3(CH_3)_4N$, $H_3C(C_6H_4)SO_3H$.

42. The method of preparing the electrically conductive polymer system defined in claim 38, wherein

said dielectric polymer is selected from the group consisting of interpolymers of acrylonitrile-butadiene-styrene, acetal acrylic liquid crystal polymers, polybutylene terephthalate, polycarbonate, polyester, polyetherimide, polyethersulfone, polyethylene, polyethylene terephthalate, polyphenylene oxide, polyphenylene sulfide, polypropylene, polystyrene, polyurethane, polyvinyl chloride, styrene-acrylonitrile copolymer and thermoplastic elastomer; and said thermally deblockable dopants are selected from the group consisting of $CF_3SO_3H\ NC_5H_5$, $CF_3SO_3H \cdot NH_3$, $CF_3SO_3H \cdot CH_3NHC$, $CF_3SO_3H \cdot (CH_3)_3N$, $CF_3SO_3H \cdot C_2H_5NH_2$, $CF_3SO_3H \cdot (C_2H_5)_2NH$, $CF_3SO_3H \cdot (C_2H_5)_3N$, $CF_3SO_3H \cdot (i - C_3H_7)_2NH$, $CF_3SO_3H \cdot (i - C_3H_7)_2N(C_2H_5)$, $CF_3SO_3H \cdot (i - C_3H_7)_2N(C_2H_4OH)$, $CF_3SO_3H \cdot H_2N(C_2H_4OH)$, $CF_3SO_3H \cdot HNC_4H_8O$, $CF_3SO_3H \cdot H_2NC(CH_3)_2CH_2OH$, $CF_3SO_3H \cdot HNC_5H_{10}$, $CF_3SO_3H \cdot HN(C_2H_4OH)_2$, $BF_3C_2H_5NH_2$, $CF_3SO_3(CH_3)_4N$, $H_3C(C_6H_4)SO_3H$.

43. The method of preparing the electrically conducting polymer blend defined in claim 35 wherein the blend is formed into a conductive gel in dilute solution which is formed into a shaped article.

44. The method of preparing the electrically conducting polymer system defined in claim 35 wherein

said blend is processed in the solid state.

45. The method defined in claim 43 wherein said shaped article is a fiber.

46. The method defined in claim 43 wherein said shaped article is a film.

47. The method defined in claim 43 wherein said shaped article is a body.

48. A method comprising applying a conducting polymer to the surface of a non conducting shaped article.

49. The method defined in claim 48 wherein said conducting polymer is solution deposited.

50. The method defined in claim 48 wherein said conducting polymer is vapor deposited.

51. The method defined in claim 48 wherein said conducting polymer is electrochemically deposited.

52. The method defined in claim 48 wherein said conducting polymer is deposited by adsorption.